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EXAMINER
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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* GOTTLIEB-GEORG LINDNER, ROBERT KUHLMANN,  
and CLAUS-PETER DREXEL

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Appeal 2010-000463  
Application 10/079,479  
Technology Center 1700

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Decided: June 23, 2010

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Before CHARLES F. WARREN, CATHERINE Q. TIMM, and STEPHEN  
WALSH, *Administrative Patent Judges*.

WALSH, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134(a) involving claims to a precipitated silica. The Patent Examiner rejected the claims on the ground of obviousness. We have jurisdiction under 35 U.S.C. § 6(b). We reverse.

## STATEMENT OF THE CASE

Claims 1, 4, 5, 10-12, 14-19 and 22-28, which are all the pending claims, are on appeal. Claims 1 and 10 are representative and read as follows:

1. A precipitated silica having the following physicochemical characteristics:

BET surface area	from 50 to 700 m <sup>2</sup> /g;
DBP absorption	from 100 to 450 g/100 g;
Choline chloride absorption	from 150 to 400 g/100 g (75% absorption by weight aqueous solution);
CTAB surface area	from 50 to 350 m <sup>2</sup> /g;
DBP/choline chloride absorption	less than 1.07; and
Sears number	greater than 25 ml/5g.
  
10. A process for preparing precipitated silica, comprising:
  - simultaneously metering into an aqueous silicate solution more aqueous silicate solution and a Lewis and/or Brønsted acid over a precipitation period of 40 to 65 minutes followed by reacidifying the mixture to a pH of 7-3.0 to provide an acidified mixture having a solid content of the suspension of from 79.3 to 104 g/l,
  - optionally filtering the acidified mixture to obtain a filtered precipitated silica,
  - optionally drying the filtered precipitated silica,
  - wherein the metered addition of the aqueous silicate solution and the Lewis and/or Brønsted acid is carried out while maintaining a constant alkali number in the mixture of at least 15, and
  - wherein the silica has the following physicochemical characteristics:

BET surface area	from 50 to 700 m <sup>2</sup> /g;
DBP absorption	from 100 to 450 g/100 g;
Choline chloride absorption	from 150 to 400 g/100 g (75% absorption by weight aqueous solution);
CTAB surface area	from 50 to 350 m <sup>2</sup> /g;
DBP/choline chloride absorption	less than 1.07; and
Sears number	greater than 25 ml/5g.

The Examiner rejected claims 1, 4, 5, 10-12, 14-19 and 22-28 under 35 U.S.C. § 103(a) as unpatentable over EP '755<sup>1</sup> and Türk.<sup>2</sup>

## OBVIOUSNESS

### *The Issue*

The Examiner's position concerning the product claims is that EP '755 described an example precipitated silica having physicochemical characteristics reported "well within" the ranges recited in Appellants' claim 1, but for the Sears number, which EP '755 did not disclose. (Ans. 4.) The Examiner accepted Appellants' Declaration evidence that the EP '755 silica had a Sears number of  $22.6 \pm 0.25$ . (*Id.*) The Examiner found that "[e]ven though the Sears value of the value of  $22.6 \pm 0.25$  for produc[t] C(13) as disclosed in EP '755 is lower than the claimed value of 'greater than 25 []', however, the value of '22.6' would have suggested to one of ordinary skill in the art a slightly higher value based upon a reasonable expectation of success." (*Id.*)

The Examiner's position concerning the process claims is that EP '755 disclosed a process of precipitating silica "while maintaining a constant alkali index of 7." (*Id.* at 4-5.) As to the required characteristics recited in the claims for the silica produced by Appellants' process, the Examiner found that EP '755 disclosed ranges for those characteristics that overlap the claimed ranges, but for the Sears number. For the claimed process limitations that differ from those described by EP '755, the Examiner concluded that "[i]t would have been obvious . . . to optimize the process

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<sup>1</sup> EP 0937755, published Aug. 25, 1999.

<sup>2</sup> US 4,001,379, issued to Günter Türk et al., Jan. 4, 1977.

conditions, such as the duration of the ‘precipitation’ step, the solid content after the precipitation step, the alkali number, the pH, etc., in EP ‘755 in order to produce the desired silica, which is suitable as carrier for choline chloride solution, with the properties listed above.” (*Id.* at 6.) According to the Examiner, “[f]or the Sears number, since the product in EP ‘755 is produced by the same process, i.e. constant alkali [number] process, and has values for all other properties that at least overlap the claimed ranges, the range for the Sears number for the product of EP ‘755 would also overlap the claimed range.” (*Id.*)

As an alternative theory, the Examiner stated: “in the event that the Sears number is dependent on the alkali number, Türk ‘370 is applied as stated below.” (*Id.*) According to the Examiner, Türk taught that using a constant alkali number to produce silica would result in a product suitable as an animal feed additive, such as a choline chloride solution. (*Id.* at 7.) The Examiner found that Türk taught precipitating silica “while maintaining the alkali number substantially constant at a value within the range of 10-40.” (*Id.*) The Examiner concluded that it would have been obvious to optimize the alkali number used in the EP ‘755 to a “number between 10-40, as suggested by Türk . . . because such conditions are known and desirable for producing precipitated silica that is suitable as carriers for animal feed additives, such as choline chloride solution.” (*Id.*) “Thus, when an alkali number of higher than 15 is used in the process of EP ‘755, as suggested by Türk [], the process of EP ‘755 would produce a precipitated silica with high Sears number as required in the instant claims.” (*Id.*)

Concerning the product claims, Appellants point to the difference of “at least 10% between the claimed Sears number and the Sears number of

EP ‘755.” (App. Br. 9.) According to Appellants, the claimed increase is “significant” and “not obvious.” (*Id.* at 10.) Relying on items 3 to 13 in the Rule 132 Declaration of Dr. Lindner, Appellants argue that “[i]t is very difficult to increase the Sears number and at the same time keep all other parameters as claimed in the ranges as claimed,” and conclude that “based on EP ‘755 there is no suggestion as to how to increase the Sears number to greater than 25 ml/5g and keep” the other physicochemical characteristics within the claimed ranges. (*Id.* at 10-11.)

Concerning the process claims, Appellants rely again on their contention that the prior art had no suggestion as to how to increase the Sears number, while keeping the other parameters within the claimed range. According to Appellants, “[c]ontrary to the Examiner’s belie[f], there is no linear relationship between all parameters.” (*Id.* at 11, citing the Lindner Declaration.) Appellants read Türk as teaching that increasing the alkali number would increase the DBP, and argue that “[e]ven assuming only a minimal increase of the DBP from 216 g/100g to 220 g/100g, this would cause that the ratio DBP/CC-absorption of example C13 of EP ‘755 would increase to 1,073 which would be out of the claimed range of the present invention.” (*Id.*)

The issues with respect to this rejection are:

does the evidence support finding that a Sears number of  $22.6 \pm 0.25$  ml/5g suggested a Sears number greater than 25 ml/5g; and

does the evidence support finding that increasing the alkali number in the prior art process would reasonably have been expected to yield a process producing silica having the physicochemical characteristics recited in Appellants’ process claims.

*Findings of Fact*

1. EP ‘755 described “Example 3,” a process for preparing precipitated silica (“Product C”). (EP ‘755 17-21.)
2. The process in EP ‘755’s Example 3 held the alkali number constant at 7. (*Id.*)
3. EP ‘755 described Product C as having physicochemical characteristics within the ranges claimed for Appellants’ product, except for the Sears number. (*Id.* at 7-9.)
4. Türk described a process of precipitating silica in which the alkali number is held constant within the range 10-40 during the precipitation stage. (Türk, Claim 1.)
5. Appellants filed a “Declaration Under 37 C.F.R. § 1.132,” signed by Dr. Gottlieb Georg Lindner. (Lindner Decl.)
6. According to Declarant Lindner, “[i]t is very difficult to increase the Sears number and at the same time keep all other parameters as claimed in the ranges claimed.” (*Id.* at ¶ 4.)
7. Declarant Lindner states: “[i]n fact, the prior art cited by the Examiner discloses that increasing the alkaline number would lead to an increase of the DBP (see Example 19 of Türk).” (*Id.* at ¶ 7.)
8. Declarant Lindner states:

[e]ven assuming only a minimal increase of the DBP from 216 g/100g to 220 g/100g, this would cause that the ratio DBP/CC-absorption of example C13 of EP ‘755 would increase to 1,073 [sic, 1.073] which would be out of the claimed range of the present invention. Türk, however, teaches that the increase of the DBP would be higher than 4 g/100g. Thus, a person of ordinary skill in the art starting with example C13 of EP ‘755 would not consider increasing the alkaline number because

Türk teaches that this would cause a shift of the DBP/CC ratio out of the claimed range.

(*Id.* at ¶ 9.)

9. Declarant Lindner states: “[e]ven considering the complete disclosure of the manufacturing process disclosed in EP ‘755 in combination with [the references cited in EP ‘755], it is found that there is no disclosure by which a Sears number of > 25 could be achieved.” (*Id.* at ¶¶ 11-12.)
10. Declarant Lindner states: “[t]he increase of the sears number . . . is necessary to achieve a sufficient affinity between the silica of the invention and hydrophilic liquids. Without such affinity the desired DBP/CC ratio of below 1.07 could not be reached.” (*Id.* at ¶ 13.)

### *Principles of Law*

“Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006), cited with approval in *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 417-18 (2007).

“Obviousness does not require absolute predictability of success. . . . [A]ll that is required is a reasonable expectation of success.” *In re O’Farrell*, 853 F.2d 894, 903-04 (Fed. Cir. 1988).

### *Analysis*

We first consider whether the Sears number for the prior art EP ‘755 silica,  $22.6 \pm 0.25$  ml/5g, suggested the claimed Sears number, greater than



25 ml/5g. The rejection found that it did, but we find no evidence presented on this record that a person of ordinary skill in the art would have understood a Sears number of 22.6 to have suggested a Sears number of greater than 25. Without evidence supporting that finding, we conclude that the rejection cannot be sustained. *See Kahn*, 441 F.3d at 988 (conclusory statement insufficient to sustain obviousness). We will therefore reverse the obviousness rejection of the product claims.

Concerning the process claims, Appellants dispute that it would have been reasonable to expect to adapt EP ‘755 Example 3 with Türk’s higher alkali number and still produce a silica having all the claimed characteristics. Because Türk disclosed that a higher alkali number would yield product with an increased DBP, Appellants argue that the expected DBP increase would cause the expected product to have characteristics outside the claimed DBP/CC ratio. (App. Br. 11, citing the Lindner Declaration.) The Examiner responded: “[t]his argument is not persuasive, because as evidence [sic] by EP ‘755, silica product with a DBP/CC ratio of 1.05, which is below the required value of 1.07, and still have low Sears value (as calculated by Appellants to be 22.6 mg/5g).” (Ans. 9.) We find the Examiner’s response to this part of the Declaration unpersuasive because it appears to overlook the fact that the claims require a Sears value “greater than 25 ml/5g,” not a low Sears value.

The Examiner found that “there is no evidence on record to show that by increasing the alkali number, only the DBP number increases while the choline chloride absorption stays the same as stated in the assumption made in item 9 of the Declaration by Dr. Lindner.” (Ans. 10.) The Examiner reasoned that “in the event that both the DBP number and the choline

chloride absorption increase with increasing alkali number, the ratio between DBP number and the choline chloride absorption could still stay below 1.05.” (*Id.*) Thus, the Examiner states: “the constant alkali number might cause not only the change in the DBP number but also the CC number so the DBP/CC value might not be out of the claimed range as argued by Appellants.” (*Id.* at 12.) We find this argument unpersuasive because it is not based on evidence that changes in choline chloride absorption would have followed changes in the alkali number, or would reasonably have been expected to do so. More than the possibility that something “might” happen is needed. *See Kahn*, 441 F.3d at 988 (conclusory statement insufficient to sustain obviousness).

### CONCLUSIONS

The evidence does not support finding that a Sears number of  $22.6 \pm 0.25$  ml/5g suggested a Sears number greater than 25 ml/5g.

The evidence does not support finding that increasing the alkali number in the prior art process would reasonably have been expected to yield a process producing silica having the physicochemical characteristics recited in Appellants’ process claims.

Because the evidence does not support findings needed to sustain the proposed conclusion of obviousness, the obviousness rejection will not be affirmed.

### SUMMARY

We reverse the rejection of claims 1, 4, 5, 10-12, 14-19 and 22-28 under 35 U.S.C. § 103(a) as unpatentable over EP ’755 and Türk.

Appeal 2010-000463  
Application 10/079,479

REVERSED

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